

REMARKS

The Final Office Action mailed February 18, 2011, has been received and reviewed. Claims 1 through 3, 6 through 12, 16, 18 through 47, 49 through 54, 57, 59, 60, 63 through 65, and 79 through 85 are currently pending in the application, of which claims 1 through 3, 6 through 12, 16, 18, 24 through 28, 52 through 54, 57, 59, 60, 64, and 65 are currently under examination. Claims 19 through 23, 29 through 47, 49 through 51, 63, and 79 through 85 are withdrawn from consideration as being drawn to a non-elected invention. Claims 1 through 3, 6 through 12, 16, 18, 24 through 28, 52 through 54, 57, 59, 60, 64, and 65 stand rejected. Applicants propose to amend claims 6, 9 through 12, 59, and 64. Applicants respectfully request reconsideration of the application as presented herein.

The proposed amendments to claims 10 and 11 improve clarity and form. Support for the proposed amendments to claims 6, 9, 12, 59, and 64 may be found at least in paragraphs [0016] and [0117] of the as-filed specification.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 4,854,379 to Shaubach et al.

Claims 1, 6 through 12, 16, 26, and 28 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,854,379 to Shaubach et al. (hereinafter referred to as “Shaubach”). Applicants respectfully traverse this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Unless a single prior art reference describes “all of the limitations claimed” **and** “all of the limitations [are] **arranged or combined in the same way** as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.” *Net MoneyIN Inc. v. VeriSign Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008). A single prior art reference must “clearly and unequivocally” describe the claimed invention “without any need

for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference.” *Id.* (citing *In re Arkley*, 455 F.2d 586, 587 (C.C.P.A. 1972)).

Applicants respectfully submit that the 35 U.S.C. § 102(b) anticipation rejections of claims 1, 6 through 12, 16, 26, and 28 are improper at least because Shaubach does not inherently or expressly describe each and every element independent claim 1.

Shaubach describes a heat pipe 28 configured to isolate an external artery structure 34 from effect by heat sources 36. *Shaubach*, col. 4, lines 39-55. A wick 40 covers the inside surface of heat pipe 28 and encloses vapor space 38. *Id.* An opening 30 in artery 32 is positioned on the side most remote from the heat source 36 and functions to supply liquid to the wick 40. *Id.*

Applicants again assert that Shaubach does not describe a vapor removal channel located at an interface between the wick and a heated wall (*i.e.*, a surface forming a common boundary between the wick and a wall) and a liquid flow channel located at an interface between a liquid barrier wall and the wick (*i.e.*, a surface forming a common boundary between the wick and a wall).

In the most recent Office Action, the Examiner appears to assert that a liquid barrier wall or a heated wall may allegedly be any wall in Shaubach that may be utilized for such a purpose. However, regardless of the intended use/operation of the walls in Shaubach, there appears to be no structure (*e.g.*, walls) in Shaubach having a vapor removal channel located at an interface between the wick and the wall or a liquid flow channel located at an interface between the wall and the wick. Specifically, Shaubach does **not** describe an evaporator for a heat transfer system comprising “a vapor removal channel ***located at an interface between the primary wick and the heated wall***,” as recited in independent claim 1. As shown in FIG. 4 of Shaubach, the vapor space 38 is not located at an interface between the wick 40 and the housing of the heat pipe 28, but rather, is encompassed by the wick 40, which is in turn encompassed by the housing of the heat pipe 28.

Furthermore, Shaubach does **not** describe an evaporator for a heat transfer system comprising “a liquid flow channel ***located at an interface between the liquid barrier wall and the primary wick***,” as recited in independent claim 1. As also shown in FIG. 4, the artery 32

does not include a liquid flow channel located at an interface between the artery 32 and the wick 12. Rather, the liquid flow channel in the external artery structure 34 (*i.e.*, opening 30 in the artery 32) is disposed within the wick 12 and not at an interface between the outer wall forming the artery 32 and the wick 12.

Thus, Shaubach does not expressly or inherently describe a structure describing every element set forth in claim 1. Applicants therefore submit that, for at least these reasons, claim 1 is not anticipated by Shaubach and respectfully request that the Examiner withdraw the rejection of independent claim 1 under 35 U.S.C. § 102(b).

Applicants additionally assert that each of claims 6 through 12, 16, 26, and 28 depends directly or indirectly from claim 1, and thus includes all of the elements thereof. It is therefore respectfully submitted that claims 6 through 12, 16, 26, and 28 are allowable, *inter alia*, as depending from allowable claim 1.

Regarding dependent claim 6, Applicants additionally assert that Shaubach does not expressly or inherently describe an evaporator for a heat transfer system “wherein the vapor removal channel is ***formed in an inner surface the heated wall***,” as recited in dependent claim 6, as currently proposed to be amended. As shown in FIG. 4 of Shaubach, the vapor space 38 is ***not*** formed in an inner surface of the housing of the heat pipe 28. Rather, the vapor space 38 is separated from the housing of the heat pipe 28 by the wick 40. Thus, Shaubach does not expressly or inherently describe a structure describing every element set forth in the claim. Applicants therefore respectfully request that the Examiner withdraw the rejection of dependent claim 6 under 35 U.S.C. § 102(b) for this additional reason.

Regarding dependent claim 9, Applicants additionally assert that Shaubach does not describe an evaporator for a heat transfer system “wherein a first portion of the vapor removal channel is ***formed in an inner surface of the heated wall*** and second portion of the vapor removal channel is ***formed in an outer surface of the primary wick***,” as recited in dependent claim 9, as currently proposed to be amended. As shown in FIG. 4 of Shaubach, ***no portion*** of the vapor space 38 is formed in an inner surface of the heated wall, nor is any portion of the vapor space 38 formed in an outer surface of the wick 40. Rather, the vapor space 38 is merely positioned adjacent an inner surface of the wick 40. Thus, Shaubach does not expressly or

inherently describe a structure describing every element set forth in the claim. Applicants therefore respectfully request that the Examiner withdraw the rejection of dependent claim 9 under 35 U.S.C. § 102(b) for this additional reason.

Regarding dependent claim 12, Applicants additionally assert that Shaubach does not describe an evaporator for a heat transfer system, “wherein the vapor removal channel is *formed in an outer surface of the primary wick*,” as recited in dependent claim 12, as currently proposed to be amended. Again, as shown in FIG. 4 of Shaubach, *no portion* the vapor space 38 is formed an outer surface of the wick 40. Rather, the vapor space 38 is merely positioned adjacent an inner surface of the wick 40. Thus, Shaubach does not expressly or inherently describe a structure describing every element set forth in the claim. Applicants therefore respectfully request that the Examiner withdraw the rejection of dependent claim 12 under 35 U.S.C. § 102(b) for this additional reason.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 4,854,379 to Shaubach et al.

Claims 2, 3, 18, 24, 25, 52 through 54, 57, 59, 60, and 64 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shaubach. Applicants respectfully traverse this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness, the prior art reference itself (or references when combined) or “the inferences and creative steps that a person of ordinary skill in the art would [have] employ[ed]” at the time of the invention must teach or suggest all of the claim elements. *K.S.R. Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 82 U.S.P.Q.2d 1385 (2007); *see also* M.P.E.P. § 2143.03. Additionally, the Examiner must determine whether there is “an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *Id.* “[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *Id.* Further, rejections on obviousness grounds “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* (quoting *In re Kahn*, 441, F.3d 977, 988 (Fed. Cir. 2006)). Finally, to establish

a *prima facie* case of obviousness there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant's disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006); M.P.E.P. § 2144. Underlying the obvious determination is the fact that hindsight cannot be used. *KSR*, 550 U.S. at 421; *DyStar*, 464 F.3d at 1367.

Claims 2, 3, 18, 24, and 25

A *prima facie* case of obviousness under 35 U.S.C. § 103(a) cannot be established against any of claims 2, 3, 18, 24, and 25 because Shaubach, or the inferences and creative steps that a person of ordinary skill in the art would have employed at the time of the invention, do not teach or suggest the elements of independent claim 1.

As discussed above, Shaubach does not describe each and every claim limitation of claim 1. Applicants further assert that, for the same reasons discussed above, Shaubach does not teach or suggest, "a vapor removal channel *located at an interface between the primary wick and the heated wall*" or "a liquid flow channel *located at an interface between the liquid barrier wall and the primary wick*," as recited in claim 1. Further, there is no teaching or suggestion in Shaubach to modify the structure taught therein to include the limitations of claim 1.

Regarding claim 1, Applicants note the Examiner's general assertion that, "mere reversal of parts, duplication of parts, and rearrangement of parts relate to obvious design choice and have no patentable significance unless either critically and/or new and unexpected results are produced. See *In re Gazda*, 219 F.2d 449, 104 USPQD 400 (CCPA 1955), *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960), and *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). In this instance, applicant has failed to make a showing of either criticality or unexpected results." *Office Action*, p. 2-3.

While the Examiner's assertion appears directed toward claims 2, 3, 18, 24, and 25, given that each of these claims depends from independent claim 1, Applicants assert that the evaporator recited in claim 1 would not have been obvious as a mere rearrangement of the parts taught in

Shaubach. The court of *In re Japikse* found that “[c]laims to a hydraulic power press which read on the prior art except with regard to the position of the starting switch were held unpatentable because shifting the position of the starting switch would not have modified the operation of the device.” *See M.P.E.P.* §2144.04(VI)(C). Conversely, in the instant case, switching the location of the vapor space 38 to accord with the limitations of claim 1 would appear to significantly modify the operation of the heat pipe 28.

Referring to FIG. 4, Shaubach teaches that to prevent vapor blockage problems in the artery 32, the opening 30 in the artery 32 should be located on a side of the heat pipe 28 most remote from the heat source 36. *See Shaubach*, col. 4, lines 49-55; *see also* col. 3, lines 31-33. The reference further teaches that the artery 32 should include a solid wall (not labeled) interjected between an area subjected to the heat source 36 (*i.e.*, portion of the housing) and the opening 30, in order to deflect vapor away from the opening 30 and towards the vapor space 38. *See* FIG. 4; *see also* col. 3, lines 43-59.

The heat pipe 28 appears to require the above structural configuration as vapor generated at the inner surface of the housing must travel inward, through the wick 40, to enter the vapor space 38 and exit the heat pipe 28. To that end, switching the position of the vapor space 38 to a location between the wick 40 and the housing of the heating pipe 28 would modify the flow pattern of the vapor generated at the inner surface of the housing such that it would not require traveling through the wick 40 to exit the heat pipe 28. Accordingly, rearrangement of the parts of the heat pipe 28 to accord with the evaporator recited in claim 1 would appear to modify the operation of the heat pipe 28 and would not be a mere rearrangement of parts.

In view of the foregoing, Applicants assert that the evaporator for a heat system of claim 1 would not have been obvious to one of ordinary skill in the art based on the teachings or suggestions of Shaubach. Consequently, the nonobviousness of independent claim 1 precludes a rejection of claims 2, 3, 18, 24, and 25 which depend therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03. Therefore, the Applicants request that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection of claims 2, 3, 18, 24, and 25.

Regarding each of dependent claims 2 and 18, Applicants additionally submit that Shaubach does not describe the evaporator for a heat transfer system of claim 1, “further comprising additional vapor removal channels *located at the interface between the primary wick and the heated wall*,” as recited in each of dependant claims 2 and 18. Applicants note the Examiner’s assertion, “absent a showing a criticality and/or unexpected results, duplication of parts (i.e., channels) does not impart patentability.” *Office Action*, p.4. In response, Applicants respectfully assert that the evaporator recited in claims 2 and 18 would not be formed by a mere duplication of the vapor space 38 taught in Shaubach. As discussed above, the vapor space 38 is not located at the interface between the wick 40 and the housing of the heat pipe 28, but rather, is encompassed by the wick 40 (which in turn is encompassed by the housing of the heat pipe 28). Accordingly, somehow duplicating the vapor space 38 taught by Shaubach, would still not teach or suggest the evaporator recited in claims 2 and 18. Therefore, Applicants assert that each of dependent claims 2 and 18 would not have been obvious to a person of ordinary skill in the art at the time the invention was made considering Shaubach, and request that the Examiner withdraw the rejection of each of dependent claims 2 and 18 under 35 U.S.C. § 103(a) for this additional reason.

Claims 52 through 54, 57, 59, 60, and 64

A *prima facie* case of obviousness under 35 U.S.C. § 103(a) cannot be established against any of claims 52 through 54, 57, 59, 60, and 64 because Shaubach, or the inferences and creative steps that a person of ordinary skill in the art would have employed at the time of the invention, do not teach or suggest the elements of claim 52.

For reasons substantially similar to those presented above in relation to independent claim 1, it is submitted that Shaubach also does not teach or suggest an evaporator for a heat transfer system comprising “a vapor removal channel located at an interface between the primary wick and the heated wall” and “a liquid flow channel located at an interface between the liquid barrier wall and the primary wick,” as recited in independent claim 52. Applicants thus assert that the claim 52 would not have been obvious to one of ordinary skill in the art based on the teachings of the Shaubach.

Consequently, the nonobviousness of independent claim 52 precludes a rejection of claims 53, 54, 57, 59, 60, and 64 which depend therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03. Therefore, the Applicants request that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to independent claim 52 and claims 53, 54, 57, 59, 60, and 64 which depend therefrom.

Regarding dependent claim 59, for substantially the same reasons presented above in relation to claims 1 and 6, Applicants additionally submit that Shaubach does not teach or suggest an evaporator for a heat transfer system, “wherein the vapor removal channel is ***formed in an inner surface the heated wall***,” as recited in dependent claim 59, as currently proposed to be amended. Therefore, Applicants assert that dependent claim 59 would not have been obvious to a person of ordinary skill in the art at the time the invention was made considering Shaubach, and request that the Examiner withdraw the rejection of dependent claim 59 under 35 U.S.C. § 103(a) for this additional reason.

Regarding dependent claim 60, for substantially the same reasons presented above in relation to claims 1 and 9, Applicants additionally submit that Shaubach does not teach or suggest an evaporator for a heat transfer system, “wherein the vapor removal channel is ***formed in a portion of the primary wick and a portion of the heated wall***,” as recited in dependent claim 60. Therefore, Applicants assert that dependent claim 59 would not have been obvious to a person of ordinary skill in the art at the time the invention was made considering Shaubach, and request that the Examiner withdraw the rejection of dependent claim 59 under 35 U.S.C. § 103(a) for this additional reason.

Regarding dependent claim 64, for substantially the same reasons presented above in relation to claims 1 and 12, Applicants additionally submit that Shaubach does not teach or suggest an evaporator for a heat transfer system, “wherein the vapor removal channel is ***formed in an outer surface of the primary wick***,” as recited in dependent claim 64, as currently proposed to be amended. Therefore, Applicants assert that dependent claim 64 would not have been obvious to a person of ordinary skill in the art at the time the invention was made

considering Shaubach, and request that the Examiner withdraw the rejection of dependent claim 64 under 35 U.S.C. § 103(a) for this additional reason.

Obviousness Rejection Based on U.S. Patent No. 4,854,379 to Shaubach et al., in View of U.S. Patent Publication No. 2002/0062648 to Ghoshal

Claims 27 and 65 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shaubach, in view of U.S. Patent Publication No. 2002/0062648 to Ghoshal (hereinafter referred to as “Ghoshal”). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claims 27 and 65 depend from one of independent claim 1 or independent claim 52 and include each of the elements recited therein. As discussed above, Shaubach does not describe, teach, or suggest each and every element of claim 1 or claim 52

Ghoshal teaches an apparatus for dense chip packaging using heat pipes and thermoelectric coolers. *Ghoshal*, Abstract. However, Ghoshal does not appear to remedy the many deficiencies of Shaubach discussed hereinabove.

Therefore, claims 27 and 65 are not obvious at least because independent claim 1 and independent claim 52, from which claims 27 and 65 respectively depend, are not obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03.

Withdrawn Claims/Rejoinder

As previously noted, claims 19 through 23 are withdrawn from consideration as directed to a nonelected invention. However, Applicants note that claims 19 through 23 depend from claim 1. Therefore, claims 19 through 23 should be rejoined and allowed in conjunction with the allowance of claim 1.

Further, claim 63 is withdrawn from consideration as directed to a nonelected invention. However, Applicants note that claim 63 depends from claim 52. Therefore, claim 63 should be rejoined and allowed in conjunction with the allowance of claim 52.

Finally, claims 30 through 47, 49 through 51, and 79 through 85 are withdrawn from consideration as directed to a nonelected invention. However, Applicants note that independent claim 29, as previously presented, and claims 30 through 47 and 49 through 51 depending

therefrom, require all the limitations of claim 1. Therefore, independent claim 29, and claims 30 through 47, and 49 through 51, depending therefrom, should be rejoined and allowed in conjunction with the allowance of claim 1. Furthermore, and 79 through 85 Applicants note that independent claim 79, as previously presented, and claims 80 through 85 depending therefrom, require all the limitations of claim 1. Therefore, independent claim 79, and claims 80 through 85, depending therefrom, should be rejoined and allowed in conjunction with the allowance of claim 1.

ENTRY OF AMENDMENTS

The proposed amendments to claims 6, 9 through 12, 59, and 64 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Further, the proposed amendments do not appear to raise new issues or require a further search as these amendments further distinguish the claims over the references of record. Finally, if the Examiner determines that the amendments do not place the application in condition for allowance, entry is respectfully requested upon filing of a Notice of Appeal herein.

CONCLUSION

Claims 1 through 3, 6 through 12, 16, 18 through 47, 49 through 54, 57, 59, 60, 63 through 65, and 79 through 85 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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